Indicators of Methamphetamine Abuse in Tennessee

Tennessee Department of Mental Health

Possible correlates of methamphetamine (meth) abuse

- Population growth

- Increasing sales of pseudoephedrine (PSE)

- Increasing number of meth labs seized
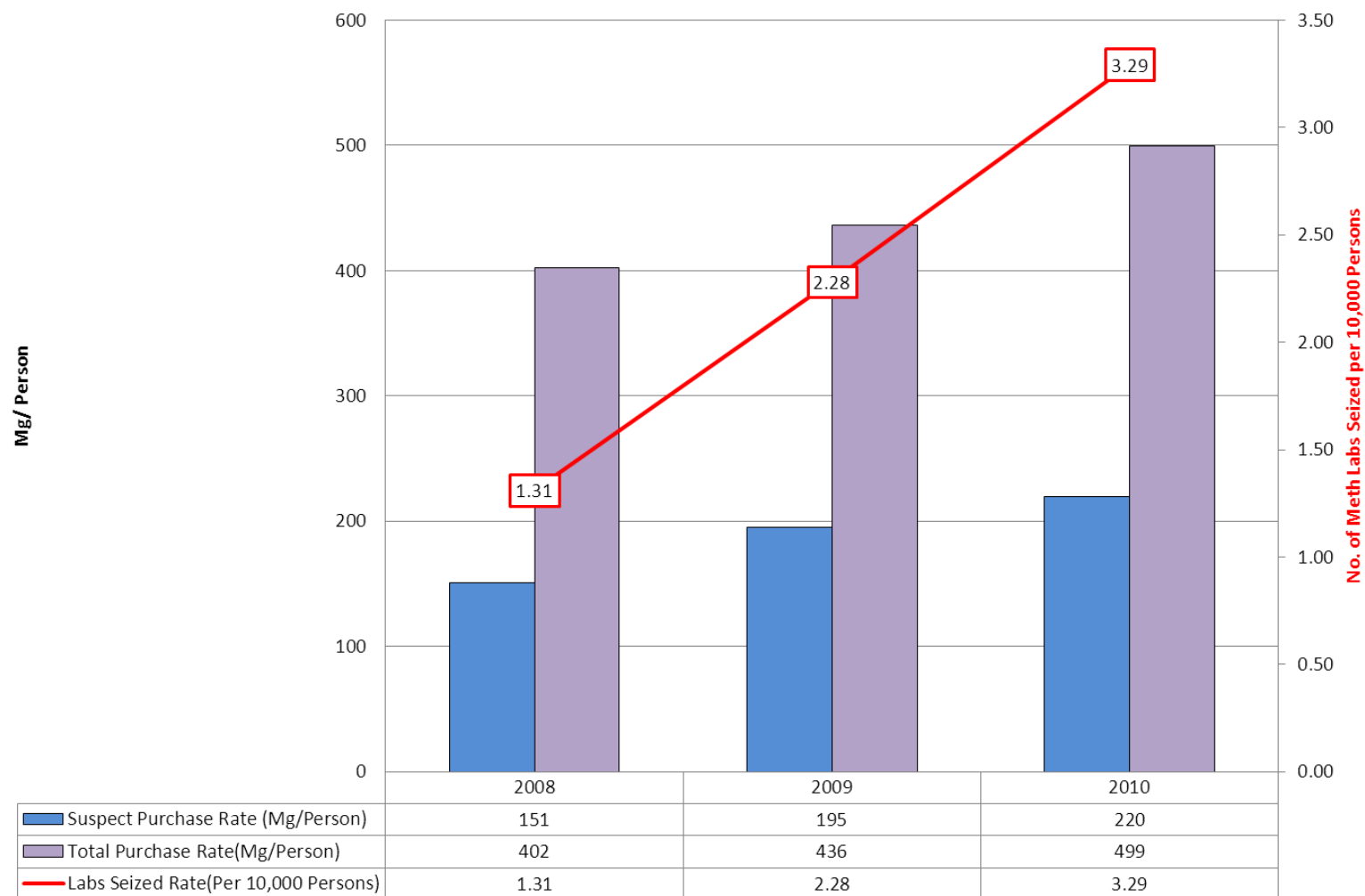
Suspect and non-suspect PSE purchases

- The Tennessee Meth Task Force measures sales by totaling the number of milligrams of PSE sold at pharmacies reporting to their information system.
- Sales of PSE are classified as suspect or non-suspect.
- Sales are suspect when a person has a history of meth abuse or a purchasing pattern indicating possible meth abuse.
- All other sales are classified as non-suspect sales.

Table 1: Tennessee Sales of Pseudoephedrine (PSE), Meth Lab Seizures and State Population - 2008 – 2010

	2008	2009	2010
State population	6,216,705	6,296,254	6,322,073
Total purchase amount (mg)	2,499,324,962	2,745,199,333	3,156,198,396
Total purchase rate (mg/person)	402	436	499
Suspect purchase amount (mg)	936,117,511	1,226,958,483	1,389,324,020
Suspect purchase rate (mg/person)	151	195	220
Meth labs seized	815	1,437	2,082

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

Chart 1: Tennessee Average Purchase Rates (Total and Suspect Mg/Person) for Pseudoephedrine and Number of Meth Labs Seized
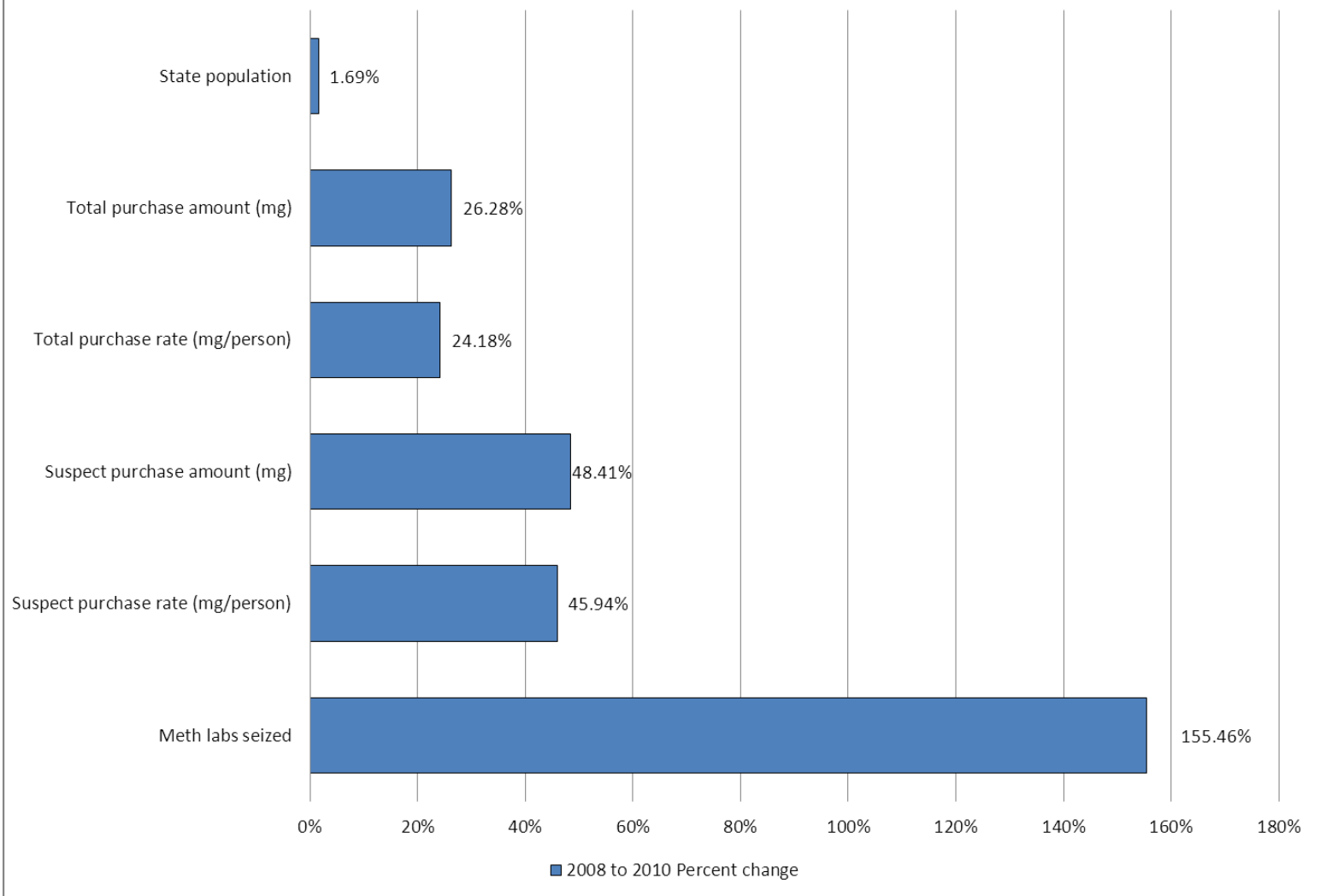
	2008	2009	2010
Suspect Purchase Rate (Mg/Person)	151	195	220
Total Purchase Rate(Mg/Person)	402	436	499
Labs Seized Rate(Per 10,000 Persons)	1.31	2.28	3.29

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

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Trends in key indicators: 2008 to 2010

- The seizure of meth labs increased **155%.**

- Suspect purchase amounts increased almost **50%.**

- Total purchase amounts increased **24%.**

- The percent change in suspect purchase amounts is nearly double that of total purchases.

Chart 2: Tennessee -- 2008 to 2010 Percent Change

- State population: 1.69%
- Total purchase amount (mg): 26.28%
- Total purchase rate (mg/person): 24.18%
- Suspect purchase amount (mg): 48.41%
- Suspect purchase rate (mg/person): 45.94%
- Meth labs seized: 155.46%

2008 to 2010 Percent change

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

The relationship between meth lab seizures and PSE purchases

- The next 3 charts illustrate the increasing correlation between PSE purchase rates and meth lab seizure rates from 2008 to 2010.

- These charts show rates of meth lab seizures per 10,000 persons and rates of PSE in milligrams purchased per person (total and suspect) for each of Tennessee's 31 judicial districts.

Note: The scale for seizure rates is represented by the secondary axis.

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

Chart 3: Purchase Rate (Total and Suspect Mg/ Person) for Pseudoephedrine and Rate of Meth Labs Seized per 10,000 Persons in 2008 for Tennessee Judicial Districts

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)
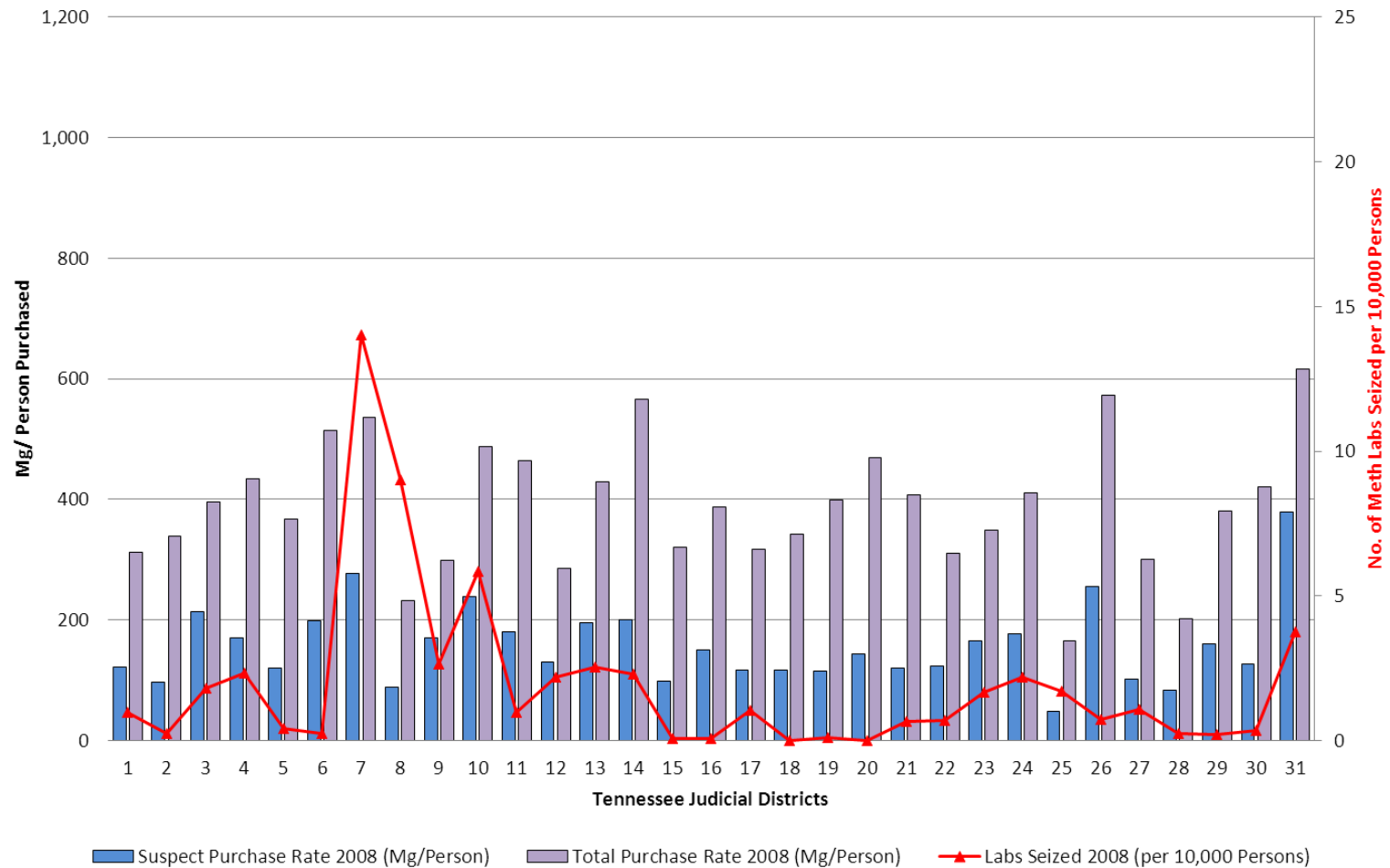
Chart 4: Purchase Rate (Total and Suspect Mg/ Person) for Pseudoephedrine and Rate of Meth Labs Seized per 10,000 Persons in 2009 for Tennessee Judicial Districts

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)
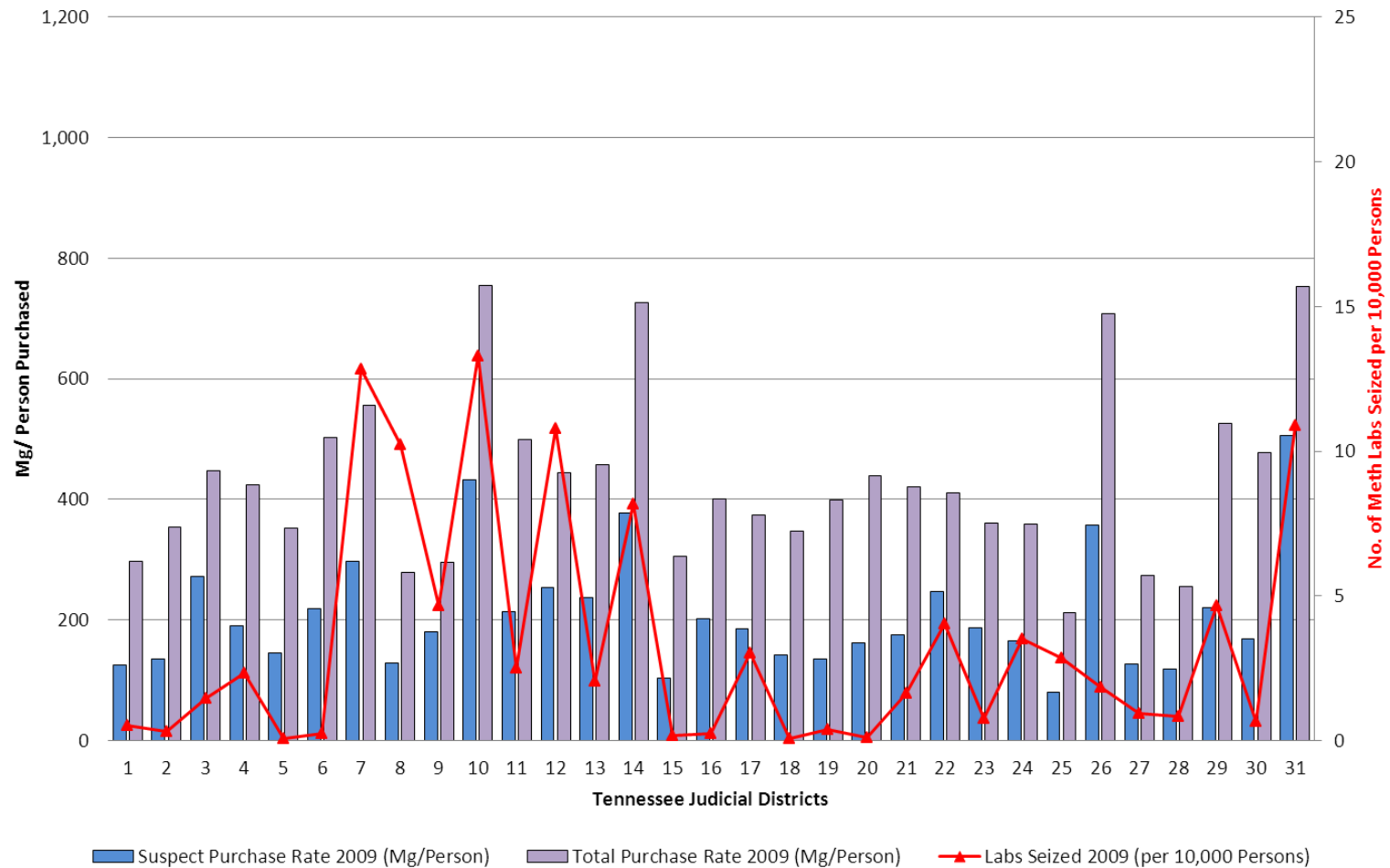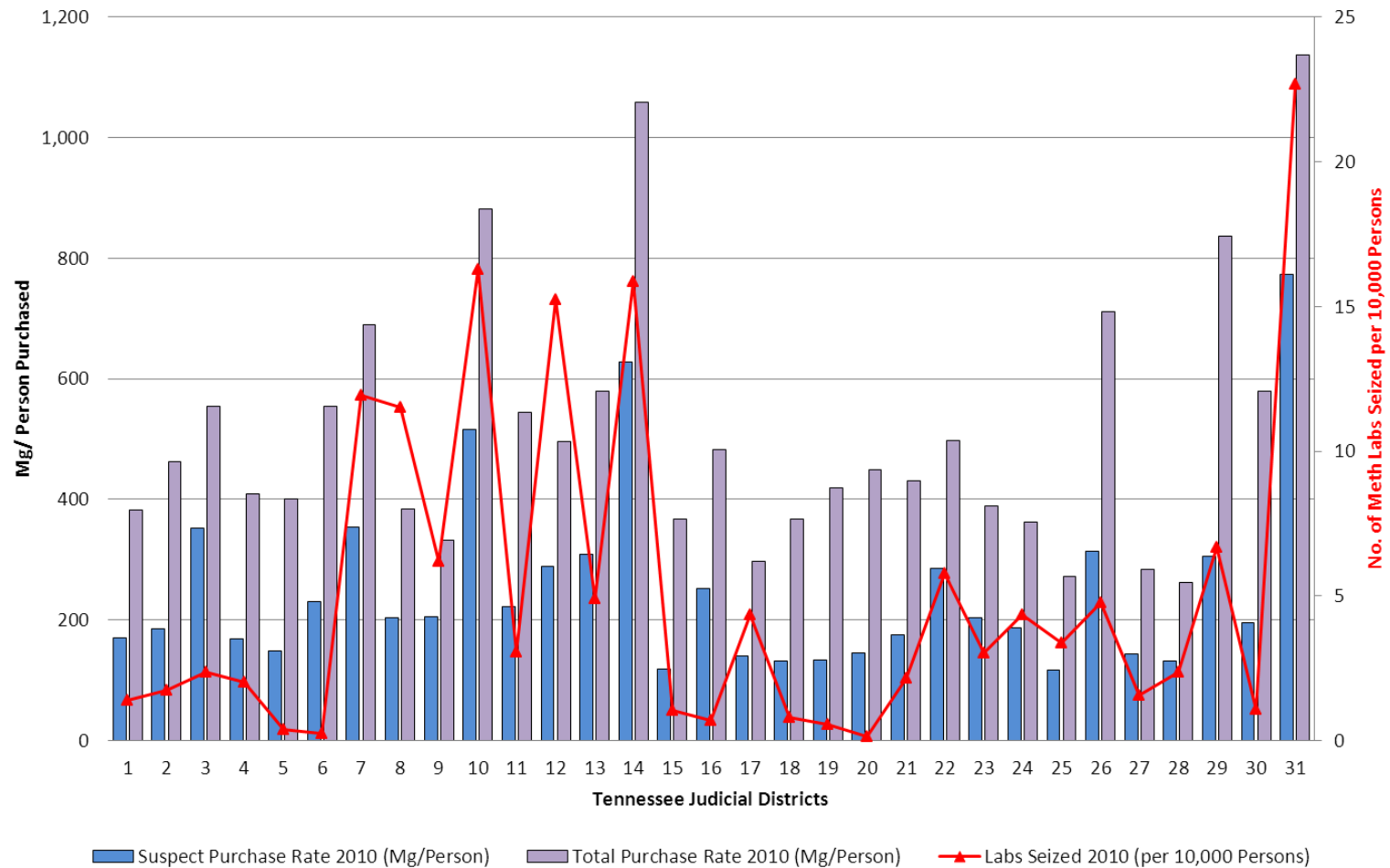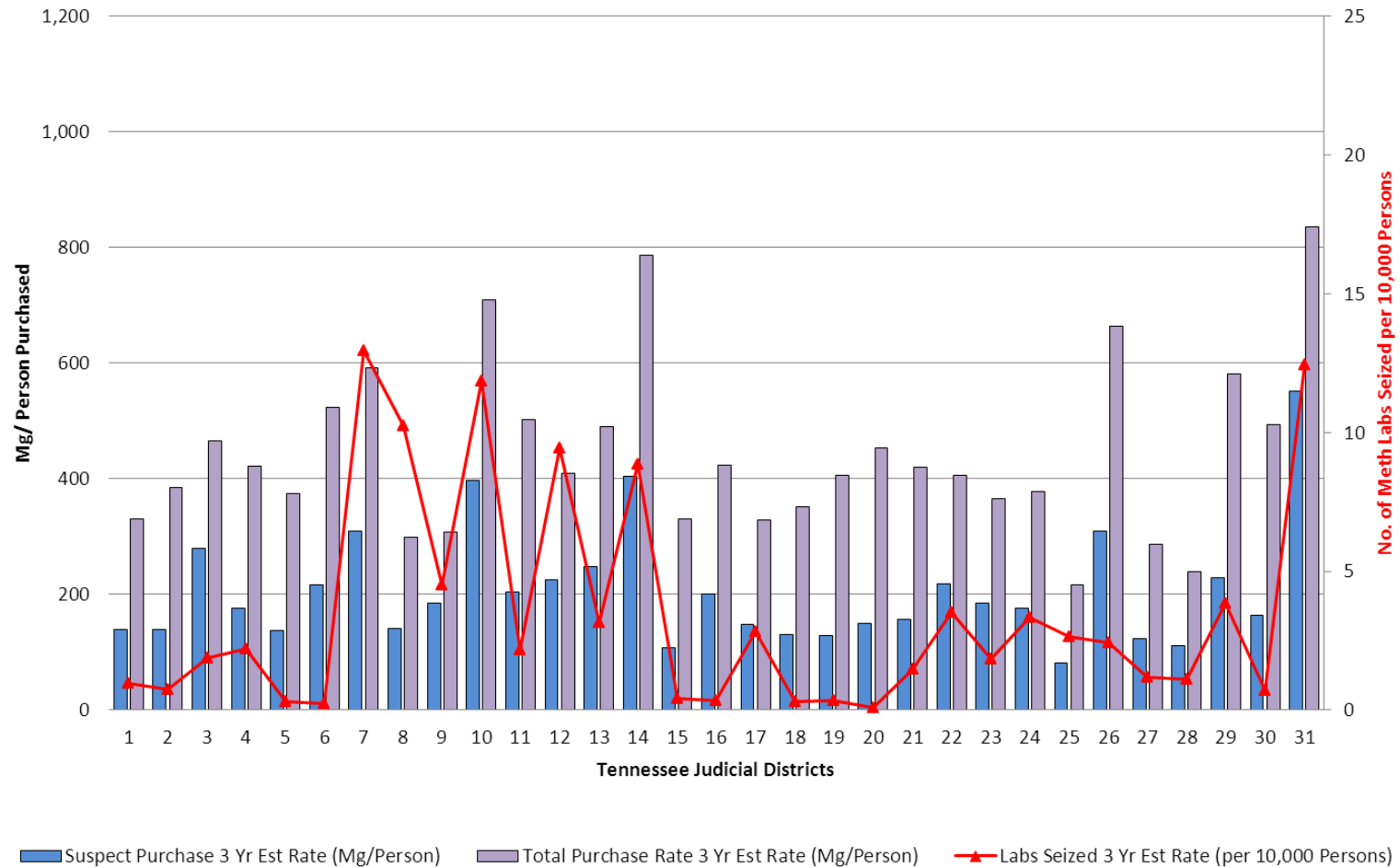
Chart 5: Purchase Rate (Total and Suspect Mg/ Person) for Pseudoephedrine and Rate of Meth Labs Seized per 10,000 Persons in 2010 for Tennessee Judicial Districts

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

Three-year estimated rate

- To get a composite picture of the relationship between PSE purchases and meth lab seizures, three-year estimated purchase rates were calculated by dividing the total amount purchased in the counties comprising a judicial district by the total population of the counties in that district.

- Higher PSE purchase rates (suspect and total) correlated with higher meth lab seizures.

Chart 6: 3 Yr. Est. Purchase Rate (Total and Suspect Mg/ Person) for Pseudoephedrine and 3 Yr Est Rate of Meth Labs Seized per 10,000 Persons in Tennessee Judicial Districts

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

Non-suspect purchase rates and meth lab seizure rates

- The correlation between meth lab seizure rates and non-suspect purchase rates is not significant. This contrasts with the correlations for suspect and total purchases with meth lab seizures.

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Table 2: Correlations for the Rates of Non-suspect Purchase of Pseudoephedrine in Tennessee with the Rate of Meth Lab Seizures per 10,000 persons in 2008 – 2010 and Three-Year Estimated Rate (2008 – 2010)

Correlation with the rate of lab seizures per 10,000 persons	2008	2009	2010	Three-year estimated rate (2008-2010)
Non-suspect rate correlation	-0.11	0.17	0.31	0.14

Note: All correlations are not significant; $p > 0.05$

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

Suspect purchase rates and meth lab seizure rates

- The correlation between meth lab seizure rates and suspect purchase rates is significant and increased from 2008 to 2010.

Table 3: Correlation for the Rate of Suspect Purchase of Pseudoephedrine in Tennessee with the Rate of Meth Lab Seizures per 10,000 persons in 2008 – 2010 and Three-Year Estimated Rate (2008 – 2010)

Correlation with the rate of lab seizures per 10,000 persons	2008	2009	2010	Three-year estimated rate (2008-2010)
Suspect rate correlation	0.41	0.65	0.84	0.71

Note: 2008: $p < 0.05$; 2009, 2010, three-year estimated rate: $p < 0.01$

Source: TN Methamphetamine Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

Total purchase rates and meth lab seizures

- The correlation of total purchase rates and meth lab seizures gets significantly stronger from 2008 to 2010.

- The increase of this correlation over time provides support for the idea that some number of total PSE purchases are linked to the production of methamphetamine.

Table 4: Correlations for Rates of Purchase of Pseudoephedrine in Tennessee with the Rate of Meth Lab Seizures per 10,000 persons in 2008 – 2010 and Three-Year Estimated Rate (2008 – 2010)

Correlation with the rate of lab seizures per 10,000 persons	2008	2009	2010	Three-year estimated rate (2008-2010)
Total purchase rate correlation	0.19	0.52	0.72	0.55

Note: 2008: Not significant; $p > 0.05$; 2009, 2010, three-year estimated rate: $p < 0.01$

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

Correlation between suspect and total purchase rates

- To examine the strength of the relationship between suspect purchase and total purchase rates, we correlated these two measures for 2008, 2009, and 2010 as well as the three-year estimated rate.

**Table 6: Correlation for Tennessee Suspect Purchase Rates with Total Purchase Rates in
2008 – 2010 and Three-Year Estimated Rate (2008 – 2010)**

Variables	2008	2009	2010	Three-year estimated rate (2008-2010)
Suspect to total purchases	0.84	0.93	0.93	0.92

- Suspect and total purchase rates are highly correlated, p < 0.001. Consequently, total purchase rates can be used as a proxy for suspect purchase rates.

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

Chart 7: 3 Yr Estimated Total Purchase Rate (Mg/ Person) for Pseudoephedrine and 3 Yr Estimated Rate of Meth Labs Seized per 10,000 Persons in Tennessee Judicial Districts

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)
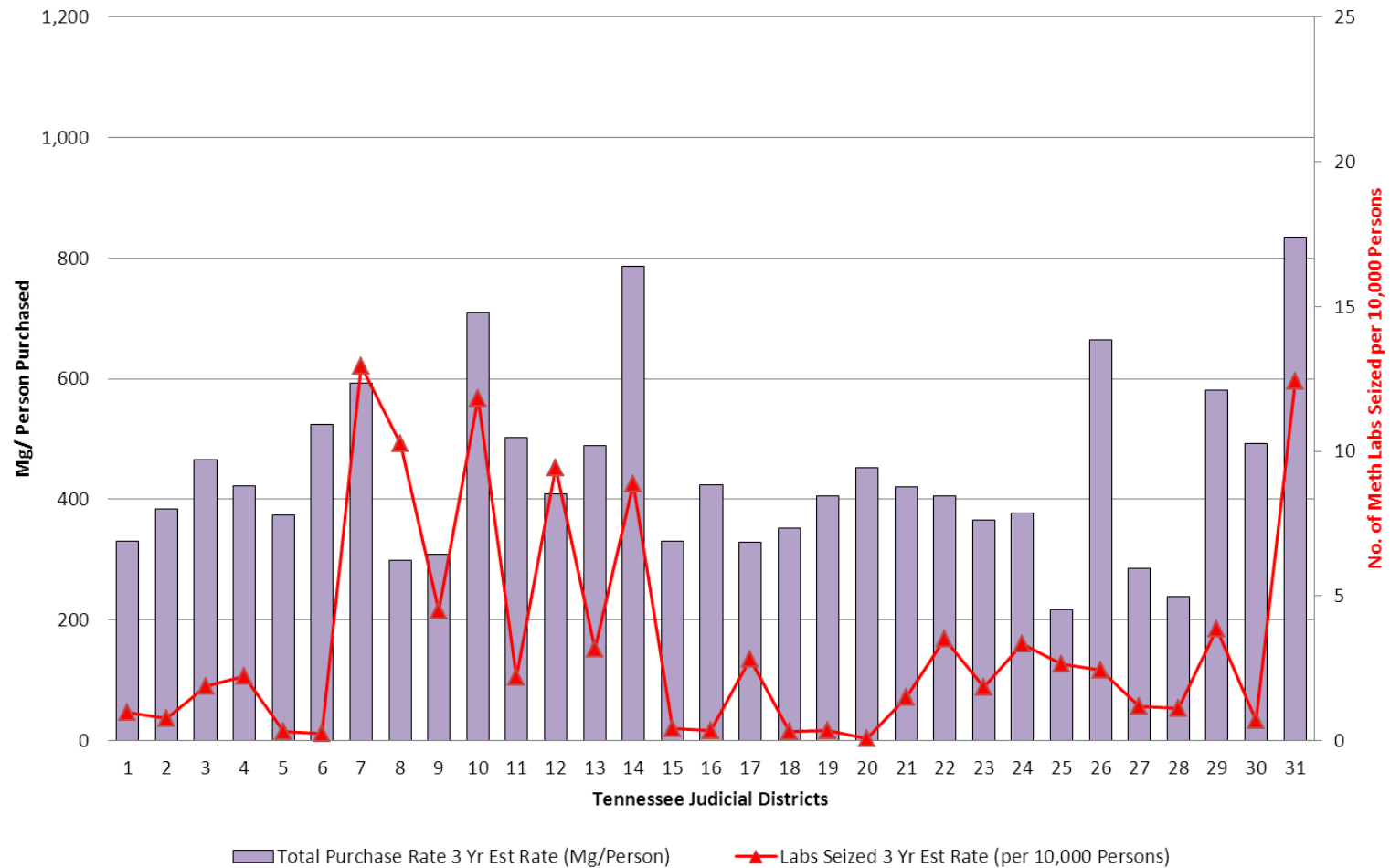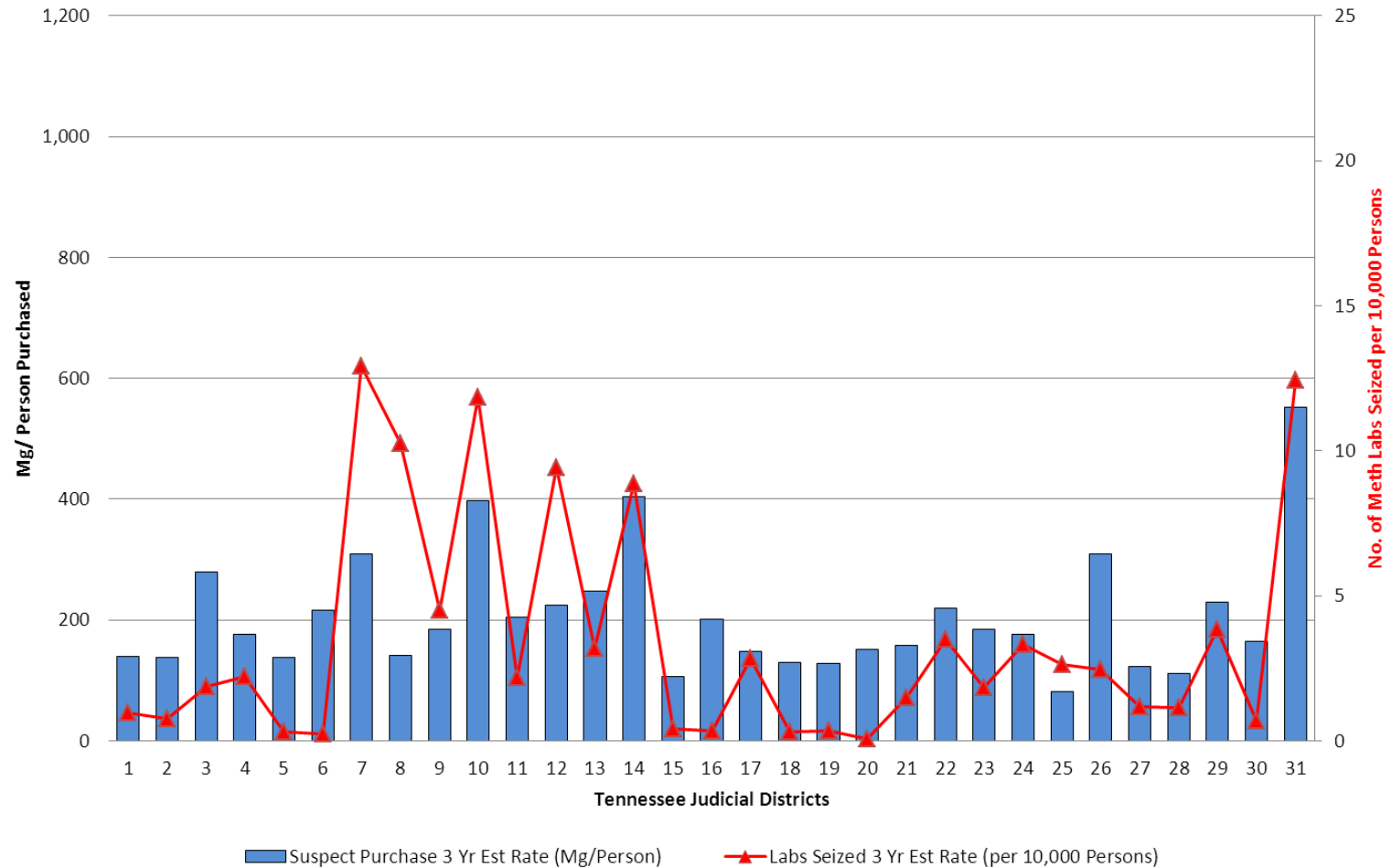
Chart 8: 3 Yr Estimated Suspect Purchase Rate (Mg/ Person) for Pseudoephedrine and 3 Yr Estimated Rate of Meth Labs Seized per 10,000 Persons in Tennessee Judicial Districts

Source: Tennessee Meth Task Force (purchase, seizures); UT Center for Business and Economic Research (population)

Correlations with other variables

- To analyze other factors that may influence the PSE purchase rates, we looked at the correlations among the following variables: population of a judicial district, household income (per person), arrest rates by district (2008) and hospitalization rates by district.

- The income rate per person correlation (-0.44) across the 3 year period indicates that meth lab seizures increase when household income decreases.

- There was no significant relationship between PSE purchase rates and drug arrests or hospital discharges related to drug abuse.

Table 5: Correlations for Rate of Household Income per Person, Arrest Rates (2008), and Drug Related Discharges with 3 Year Average (2008 – 2010) of Labs Seized per 10,000 Persons, Suspect and Total Purchase Rates by Judicial District

Variable (three-year estimated rates)	Rate of Household Income (per Person)	Arrest Rates 2008 (per Person)	Hospitalization Rates 2008 (per Person)
Rate of lab seizures per 10,000 persons	-0.44	-0.09	0.19
Suspect purchase rates	-0.27	-0.08	0.14
Total purchase rates	-0.05	0.12	0.10

The rate of household income (per person) is negatively correlated, $p < 0.05$, with the rate of meth lab seizures. No other measures have significant correlations, $p > 0.05$.

Table 6: Correlations for 3 Year average Judicial District Population with 3 Year Average (2008 – 2010) Meth Labs Seized per Judicial District

Variable (three-year estimates)	Judicial District Population
Meth labs seized	-0.18
Suspect purchase amount	-0.01
Total purchase amount	0.07

Note: All correlations are not significant; $p > 0.05$

# Meth lab seizures and PSE scheduling in TN border states

- Table 7 shows meth lab seizure rates per 10,000 persons in states bordering Tennessee.
- The yellow shading marks the year when a state added PSE to the list of controlled substances.
- For MS, the yellow shading also indicates the year when a prescription was required to access PSE.
- Blue shading indicates the year when the federal Combat Methamphetamine Law of 2006 went into effect. This law required purchase quantity limits for non-liquid PSE and clerk intervention to place methamphetamine precursor products behind the counter or in locked cabinets at the point of sale.

Table 7: Rate of Meth Lab Incidents per 10,000 Persons in States Bordering Tennessee 2004 – 2010

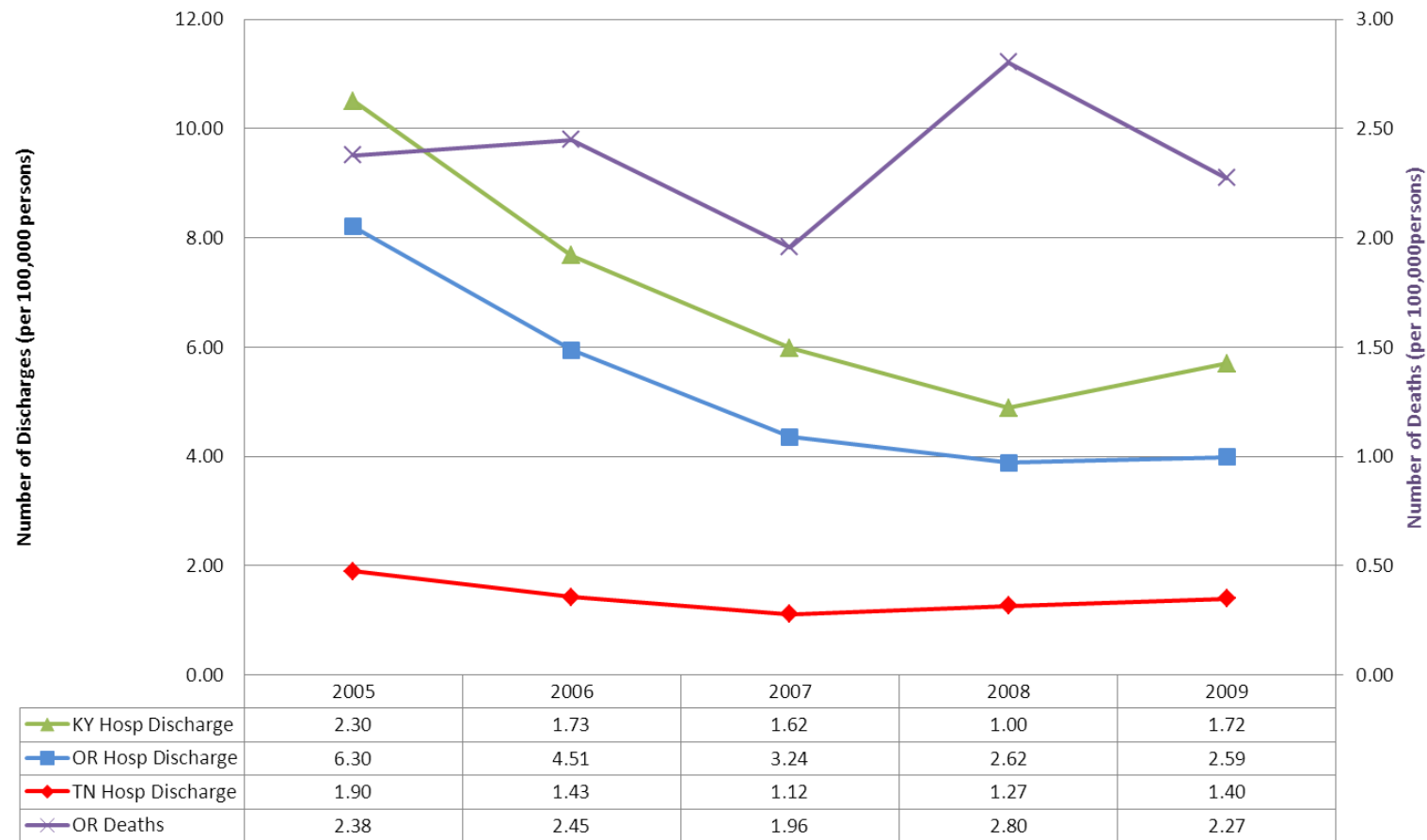|	2004	2005	2006	2007	2008	2009	2010
AL	1.04	0.64	0.45	0.47	1.29	1.3	1.38
AR	2.94	1.73	1.37	1.12	1.21	1.66	1.65
GA	0.33	0.34	0.17	0.07	0.09	0.13	0.16
KY	1.42	1.39	0.77	0.7	1	1.63	2.41
MO	4.9	3.86	2.22	2.13	2.48	2.94	3.19
MS	1.11	0.77	0.87	0.53	1.02	2.34	2.34
TN	2.47	1.52	1.3	0.91	0.93	0.95	1.88
VA	0.1	0.07	0.03	0.03	0.02	0.04	0.13

Source: El Paso Intelligence Center (meth lab incidents), U.S. Census Bureau, Population Division (population data)

Chart 9: Meth Lab Incidents per 10,000 Persons in States Bordering Tennessee 2004 - 2010
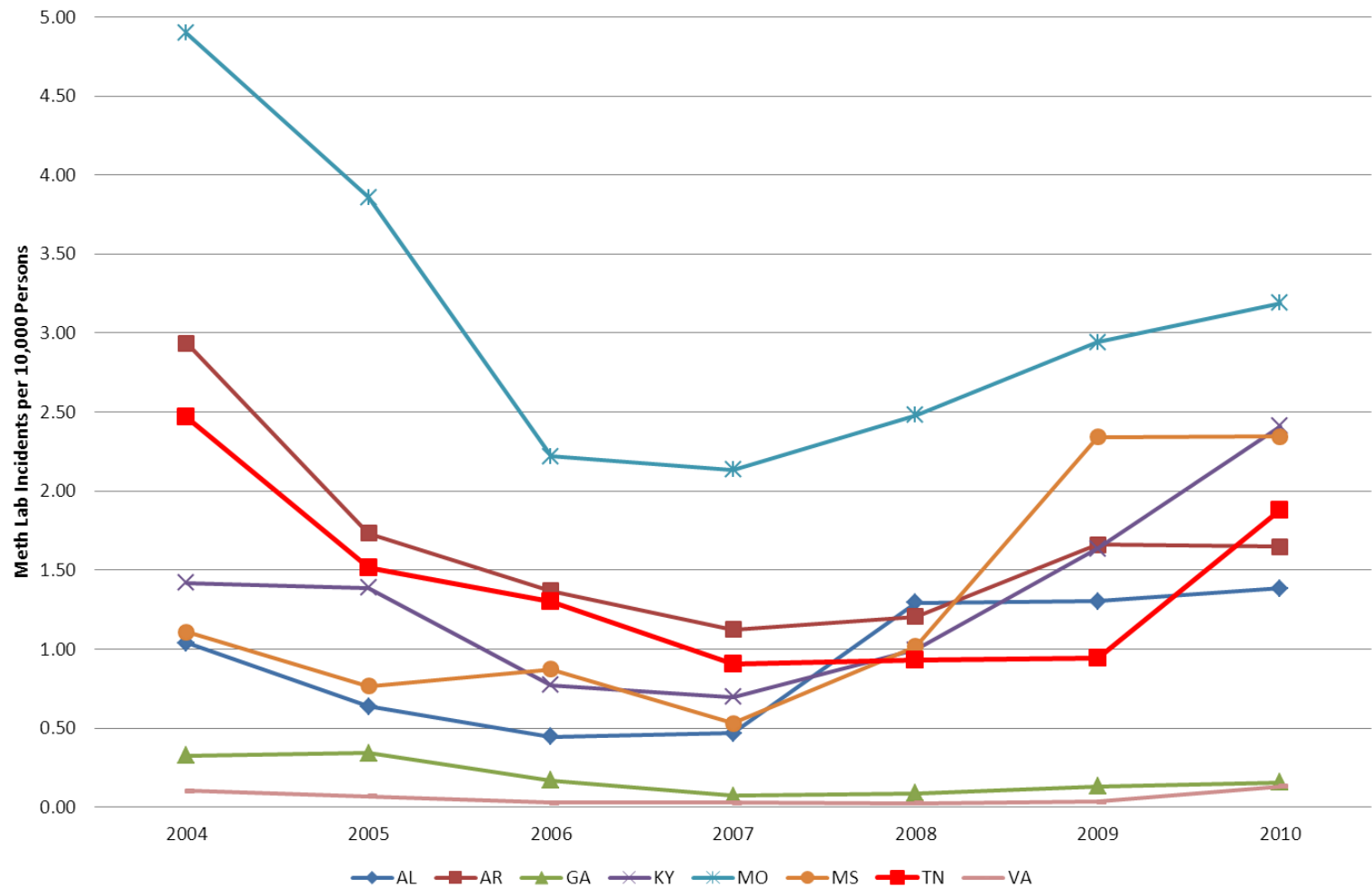
Source: El Paso Intelligence Center (meth lab incidents), U.S. Census Bureau, Population Division (population data)

Chart 10: Hospital Discharges in Tennessee, Oregon, and Kentucky (per 100,000 persons) with a Primary Diagnosis of Amphetamine Abuse (2005-2009) Compared to Meth-Related Deaths in Oregon (2005-2009)

	2005	2006	2007	2008	2009
KY Hosp Discharge	2.30	1.73	1.62	1.00	1.72
OR Hosp Discharge	6.30	4.51	3.24	2.62	2.59
TN Hosp Discharge	1.90	1.43	1.12	1.27	1.40
OR Deaths	2.38	2.45	1.96	2.80	2.27

Source: Healthcare Cost and Utilization Project (discharges), U.S. Census Bureau, Population Division (population), Oregon State Medical Examiner's Office (deaths)

Tennessee Judicial Districts (1 – 20)

- District 1 – Carter, Johnson, Unicoi, Washington
- District 2 – Sullivan
- District 3 – Greene, Hamblen, Hancock, Hawkins
- District 4 – Cocke, Grainger, Jefferson, Sevier
- District 5 – Blount
- District 6 – Knox
- District 7 – Anderson
- District 8 – Campbell, Claiborne, Fentress, Scott, Union
- District 9 – Loudon, Meigs, Morgan, Roane
- District 10 – Bradley, McMinn, Monroe, Polk

- District 11 – Hamilton
- District 12 – Bledsoe, Franklin, Grundy, Marion, Rhea, Sequatchie
- District 13 – Clay, Cumberland, DeKalb, Overton, Pickett, Putnam, White
- District 14 – Coffee
- District 15 – Jackson, Macon, Smith, Trousdale, Wilson
- District 16 – Cannon and Rutherford
- District 17 – Bedford, Lincoln, Marshall, Moore
- District 18 – Sumner
- District 19 – Montgomery and Robertson
- District 20 – Davidson

Tennessee Judicial Districts (21 – 31)

- District 21 – Hickman, Lewis, Perry, Williamson
- District 22 – Giles, Lawrence, Maury, Wayne
- District 23 – Cheatham, Dickson, Houston, Humphreys, Stewart
- District 24 – Benton, Carroll, Decatur, Hardin, Henry
- District 25 – Fayette, Hardeman, Lauderdale, McNairy, Tipton
- District 26 – Chester, Henderson, Madison
- District 27 – Obion and Weakley

- District 28 – Crockett, Gibson, Haywood
- District 29 – Dyer and Lake
- District 30 – Shelby
- District 31 – Van Buren and Warren